POWER SUPPLY UNIT 3605/33605

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Front & Rear Panel Layout (3605) ML61439/A3

General Description

The front and rear panels of the unit are partially covered by extruded aluminium heat sinks and the remaining four sides are enclosed by a perforated steel cover. Front panel controls are:-

1) A locking a.c. power ON/OFF switch

2) a.c. fuse

3) d.c. fuse

4) Indicator lamp

The unit is fitted with both overcurrent and overvoltage protection and will switch on into a combination of resistive, capacitive and lamp loads. The a.c. power transformer is constructed from gain orientated silicon iron laminations using 'E' and 'I' pieces and is designed to operate at a maximum flux density of 0.7 Webers per square meter. The saturation density of silicon iron is 1.6 Webers per square meter. Magnetic leakage fields are thus minimal.

Uses:

The unit has been designed for use as a single module, or used rack-mounted in a frame accommodating up to three modules. The depth measurement includes the space required at the rear for cable connections. The high reliability of the power supply and its convenient availability in 5A units renders suitable for powering a wide range of control consoles requiring a 24V d.c. supply.

Specification

Input Connector:		XLR-LNE
Output Connector:		EP-5-17S (d.c. output)
A.C. Input:	i.	100 - 130V a.c.
	ii.	198 - 260V a.c.
		50 - 60 Hz single phase
A.C. Input Protection:		2 Amp anti-surge fuse
Output:		20.0V, + 1V, -0V rated at 5 amps*
		*Note: When utilising these supplies in various Neve Consoles, it is good engineering practice to load a supply up to 80% of its maximum capacity (i.e. 5 amp. supplies should normally be loaded to 4 amps).
Overload Protection:	1.	Circuit. Folds back to 1-2 amps if output reaches 115% or rated maximum.
	2.	Voltage. 'Crowbar' circuit operates at 125% of rated output voltage, bringing output to ground in 1 µS after a delay of 50 mS.

Specification continued

Short Circuit Protection:	The supply is protected against long term short circuits. The short circuit current is 1-2 amps depending on the a.c. input voltage. The unit will switch on into a combination of resistive, capacitive and lamp loads.
Line Regulation:	0.02% output voltage change for a 10% a.c. input voltage change.
Load Regulation:	0.02% output voltage change, no load to full load.
Transient Response:	20 µS recovery time after maximum resistive load changes.
Output Impedance:	Less than 0.5 milliohm at 100 Hz Less than 2 milliohm at 1 kHz Less than 20 milliohm at 10 kHz Less than 40 milliohm at 20 kHz Less than 100 milliohm at 50 kHz Less than 250 milliohm at 100 kHz
Ripple and Noise:	Better than -85 dBm at maximum rated output current, measured 20 Hz - 20 kHz.
Magnetic Hum:	Does not exceed 1.0 Gauss around the steel outer cover, and does not exceed 0.1 Gauss, 4" away from the module.
Dimensions:	Height ... ... 5" (127 mm) Width ... ... 5.5" (142 mm) Depth ... ... 15.5" (394 mm)

24 Volt 5 Ampere Regulator Board BA358

Circuit Description

The BA358 has been designed as the main block of a fixed voltage, series regulated power supply - the 3600 and 3605 modules - and includes external sensing, overload protection and over voltage protection.

The voltage applied at the external load is sensed by wires at pins 12 and 14 and a proporation of this output voltage is compared against a fixed reference voltage, generated by the zener diode D2 and fed from the regulated supply via resistors R13 and R14. Any error signal is amplified by the long-tailed pair Tr6 and Tr7 and is used to control the driver transistor Tr4 which in turn feeds the four series output transistors mounted remotely from the board on the module's front and rear heat sinks.

Overload and Short Circuit Protection

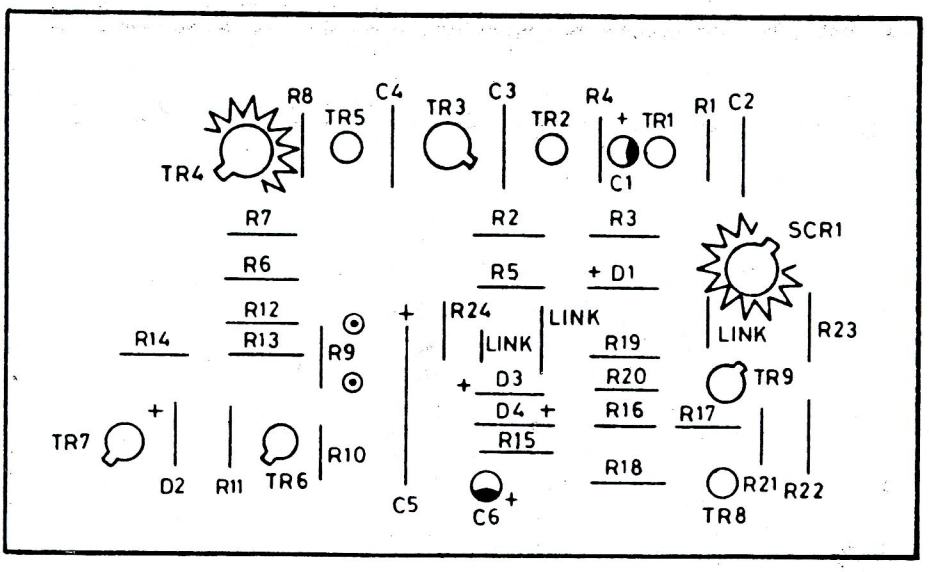
Both of these facilities are provided by the single transistor Tr1. The value of the external resistor connected between pins 3 and 4 determines the maximum current that can be taken from the supply. Under normal conditions Tr1 is non-conducting, since the voltage drop across the external resistor and R1 is less than the base-to-emitter voltage of Tr1. However, on overload Tr1 is brought into conduction which turns off the current source Tr2 and Tr3 and hence the drive current to the series pass transistors. Alternatively in the event of a short circuit at the output, a fixed current flows through R1, R3 and D1. The voltage drop across R1 turns Tr1 on and the output current is limited to a safe level until the short circuit is removed.

Over-Voltage Protection

The over-voltage circuitry protects the external equipment from damage due to excess voltage. With the supply within the specified limits of 24-30 volts, the SCR is non-conducting. If the voltage at the output exceeds 30 volts; the zener diodes D3 and D4 conduct and charge the capacitor C6 at a rate determined by the time constant C6 R15. Transistors Tr8 and Tr9 form a high speed switch which turns the SCR ON. In the event of a serious failure in the regulator the SCR is turned ON and will blow the 5 ampere d.c. output fuse.

PARTS LIST 3605

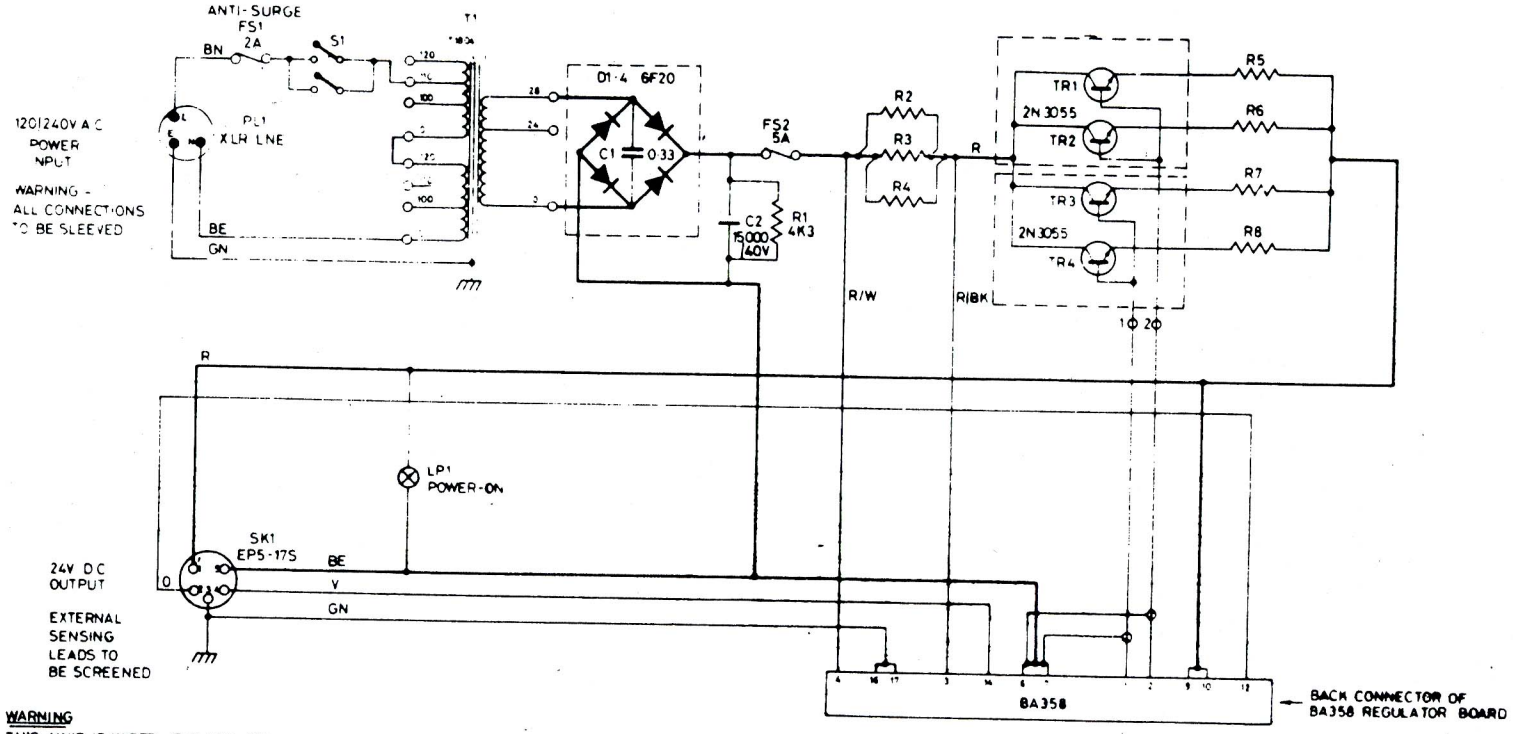
Ref	Description	Part No.
R1	Resistor TR4 5% 4K3 ohms	RA004K3
R2-R8	Resistor W.W 0.33 ohms	RJ00R33
C1	Capacitor, Mullard 330 nF	CA23300
C2	Capacitor, Electro. 15,000 µF, 40V	CA70800
S1	Switch Painton, Toggle	SW10100
LP1	Lampholder LS9, Red	LH10614
	Lamp 28V LS9	LA11100
FS1	Fuse, 2 Amps Anti-surge	FU10002
FS2	Fuse, 5 Amps Quick-Blow	FU12004
	Fuse-Holder	FU18001
TR1-4	Transistor 2N3055	TR16000
	Insulation kit for diode 6F20	SA10000
D1-4	Diode 6F20	DD10401
T1	Transformer T1804	TF14009
	Transistor insulating cover (for 2N3055)	SA10001
	Terminal strip, Harwin	WA17404
	Connector 17-way socket	CN20341
	Connector socket EP5-17S	CN20103
	Plug XLR LNE 11C	CN10071



PARTS LIST

Ref	Description				Part No.
R1	Resistor	100	TR4	2%	RA100RO
R2	"	20K	"	"	RA020KO
R3	"	5K1	"	"	RA005K1
R4	"	100	"	"	RA100RO
R5	"	2K4	"	"	RA002K4
R6	"	150	"	"	RA150RO
R7	"	10K	"	"	RA010KO
R8	"	560	"	"	RA560RO
R9	"	4K7	"	"	RA004K7
R10	"	1K5	"	"	RA001K5
R11	"	3KO	"	"	RA003KO
R12	"	10K	"	"	RA010KO
R13,14	"	430	"	"	RA430RO
R15	"	6K8	"	"	RA006K8
R16	"	10K	"	"	RA010KO
R17	"	1M	CR25		RF001MO
R18	"	10K	TR4	2%	RA010KO
R19	"	2K4	"	"	RA002K4
R20	"	10K	"	"	RA010KO
R21,22	"	1K	"	"	RA001KO
R23,24	"	100	"	"	RA100RO
C1	Capacitor	10	µF, 25V TAG		CA60100
C2	"	100	nF, C280AE/P100K		CA21000
C3,4,	"	15	nF, C280AE/P15K		CA20150
C5	"	100	µF, 25V		CA61002
C6	"	22	µF, 16V TAG		CA60223

Ref	Description	Part No.
D1	Zener ZF12	DD17600
D2	Zener IN 5234B	DD16900
D3,4	Zener ZF15	DD17800
SCR1	SCR ATES 40654	DD14000
TR1,2,5	BC 214C	TR12402
TR3	BC 461-6	TR12201
TR4	BC 441-6	TR16201
TR6,7	BC 107B	TR16400
TR8	BC 184C	TR16401
TR9	BC 461-6	TR12201
Qty 1	Connector 17 way plug AMP 3-582152-1	CN10342
Qty 1	Printed Circuit Board (Unassembled)	EV10358
Qty 7	Transistor mtg pad - small	SA10400
Qty 3	Transistor mtg pad - large	SA10200
Qty 2	Heat Sink	SA14202



WARNING
THIS UNIT IS WIRED FOR USE ON
MAINS INPUT OF 198 - 220 VOLTS

NB

R2, R3, R4, R5, R6, R7, & R8 } 0·33Ω 2·5W (MOUNTED ON TURRET TAGS)

D1-4 MOUNTED ON INTERNAL HEAT SINK

TR1 AND TR2 MOUNTED ON FRONT HEAT SINK

TR3 AND TR4 MOUNTED ON BACK HEAT SINK.

—— DENOTED CABLES IN 30/0,25 OR EQUIV.

FOR BA358 CCT SEE EX10358

ET 10087 ISSUE 2

1	2	3	4	5	6

DRAWING No.

ML61439

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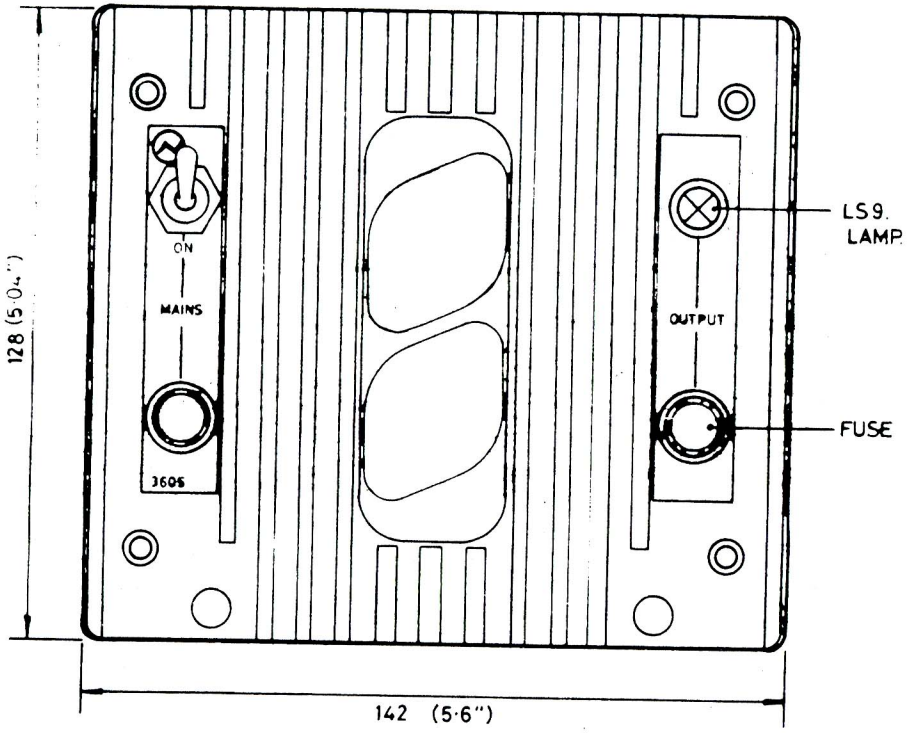
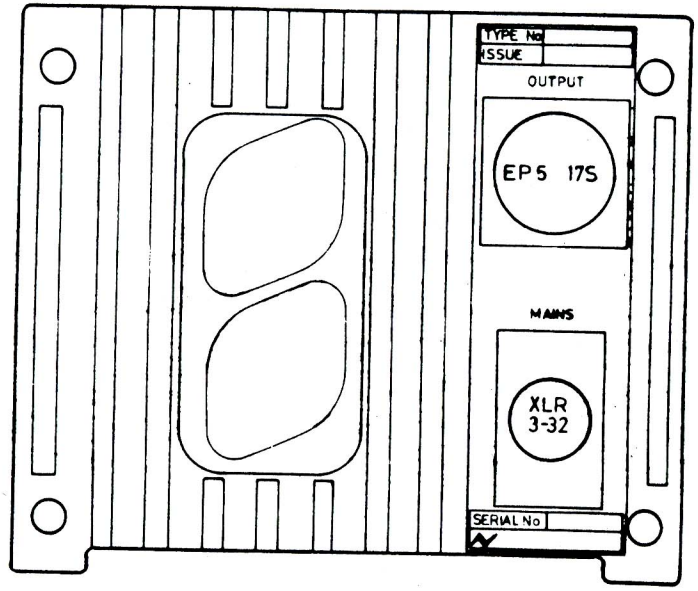


FRONT VIEW



REAR VIEW

NOTES:- 1) UNIT SUPPLIED STRAPPED FOR 110/220 V— TAPS AVAILABLE FOR 220/230/240 V A.C.

2) THIS PSU IS SUITABLE FOR USE FREE STANDING OR FOR 19" RACK MOUNTING IN A 5·25" HIGH RACK FRAME ASSEMBLY WHICH SUPPORTS 3 SIMILAR PSU MODULES

3) HEAT SINK PROTRUDES 29 mm (1·14") FORWARD FROM FRONT & REAR PANELS

4) TOTAL DEPTH 398mm (15·67")

	1	ISSUE	FIRST USED ON A3707	MATL.	TOL. UNLESS OTHERWISE STATED: LINEAR ± —; ANGULAR —; HOLES +0.13 −0
	2-4-76	DATE	DRN. SCL	FINISH —	3rd ANGLE PRJ.; DIMS. IN mm; SCALE 1:1
		CHANGE NOTE No	TRACED		
		CHECKED	CHECKED PML	TITLE POWER SUPPLY 3605	DRG. No. ML 61439

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DRAWING No.
EX10358

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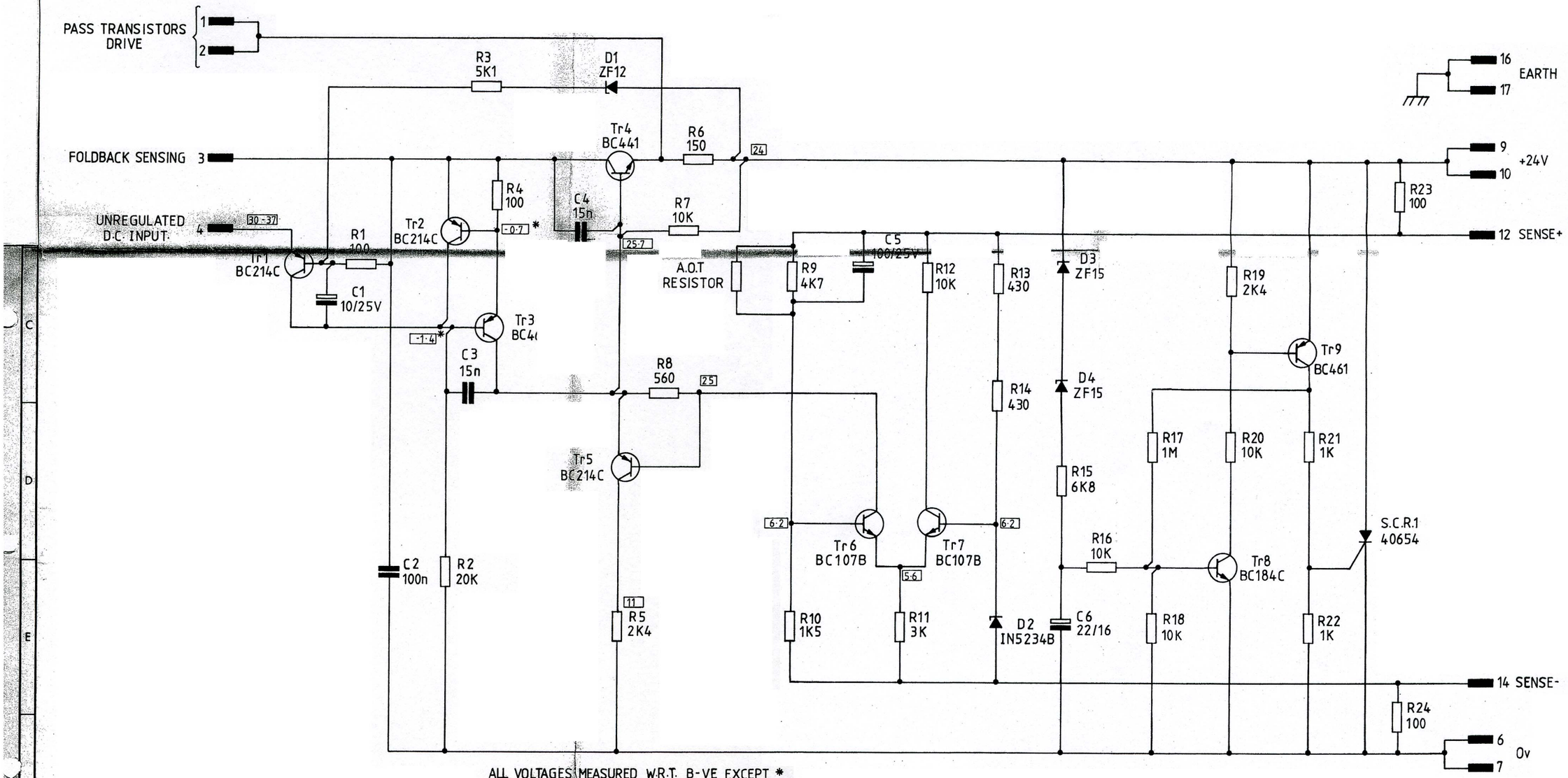

ALL VOLTAGES MEASURED W.R.T. B-VE EXCEPT * WHICH ARE W.R.T. PIN 3.
FOR A.O.T. RESISTOR SEE TEST SPEC. EZ10358
ALL RESISTORS M.O. 2%
HEATSINK FITTED TO SCR1 & TR4

	2	1	ISSUE	FIRST USED ON A3012	MATL.	TOL. UNLESS OTHERWISE STATED: LINEAR +/-	ANGULAR	HOLES +0.13 -0
	14-1-75	19-3-74	DATE	DRN. D.J.S.	FINISH	3rd ANGLE PRJ.	DIMS. IN	SCALE
	11097 RE-DRAWN 1-4-81		CHANGE NOTE Nº	TRACED S.P.W.				
	Tom Brown		CHECKED	CHECKED	TITLE BA358 24 VOLT 5 AMP REGULATOR (INCORPORATED IN 3600 MODULE)	DRG. No. EX10358		
					Neve Electronics International Ltd.	1981 ©		A2

MT A55652